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Modify Delta islands to store and convey water diverted from the Sacramento River

Category: (To be developed)
Resources Area: Water Supply (WS-FL-8)
Related Options: WS-FL-1,WS-FL-2,WS-FL-3,WS-FL-4,WS-FL-5, WS-FL-6, WS-FL-7,WS-FL-9,WS-SF-2, AR-B-1

Resources Issue: Operation of the export facilities can, at times, exacerbate the reverse flow conditions in the lower part of the San Joaquin River around Sherman Island by contributing to the creation of a net flow in the upstream direction . Reverse flow conditions are most likely to occur when the total Delta outflow, particularly the San Joaquin River component of the outflow, is insufficient to create the necessary hydraulic barrier against high tide and the intruding brackish water from the Bay. When reverse flow conditions exist, brackish Bay water is mixed with the fresh water and degrades the quality of the water in the interior Delta channels and the water that would eventually end up as export water at the project pumps. Salt content of the exported water contributes to the creation of unwanted byproducts during the treatment process of Delta source waters for industrial and municipal uses. Of particular importance is the bromide content of this brackish water that contributes to the formation of suspected carcinogens (trihalomethanes) upon disinfection of the municipal water. The expected implementation of more stringent regulations on these byproducts requires advanced treatment processes at significant costs to local agencies. Increased salt content also reduces agricultural production, and increases production costs by requiring fresh water for salt leaching from the soil. At the present, according to the operation rules outlined in the State Water Resources Control Board Decision 1485 and agreement with the Contra Costa Water District, both State Water Project and the Central Valley Project are required to release fresh water from upstream reservoirs to maintain certain quality criteria at various monitoring stations along the path to the CCWD intake at Rock Slough. This water is released to create the necessary hydraulic barrier against the intruding brackish water from the Bay, and is referred to as carriage water. If the effects of projects pumping action could be eliminated from exacerbating the reverse flow in the lower San Joaquin River, and western Delta channels flow patterns could be reestablished, carriage water could be saved and used for other beneficial uses, including exports.If western Delta channels flow patterns could be reestablished, carriage water could be used for exports. Related issues include the effects of reverse flow on the aquatic resources and the entrainment of fish in the Delta due to water project operations, practicality of construction on unstable foundation, practicality of constructing permeable levees, and feasibility of developing effective screens at the point of diversion.

Discussion: The goal of this option is to provide export water supply and reduce carriage water requirements. This action option includes the following elements:

- Constructing a 1.5 to 2.5-mile stretch of permeable levees on the east bank of the Brannan/Andrus Island, on Sacramento River below Rio Vista as intake.
- Connecting Brannan/Andrus Island, Webb Tract, Mandeville Island, Bacon Island,

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Woodward Island, Victoria Island, and Clifton Court Forebay through a system of inverted siphons.
- Strengthening levees in all of the above islands against erosion and scour.
- Enlarging Clifton Court Forebay to accommodate higher flows.

Objectives addressed: Water Supply General and Specific; Water Quality General and Specific 1, Biological Resources Specific 1.

The effects of this option on water quality and resident and migratory fish will have to be evaluated by the experts in each discipline. Also, the degree of seismic vulnerability of this option needs to be assessed by foundation, geotechnical, and structural engineering experts.

Assumptions:

- Reduction in carriage water will make additional water available for beneficial use.
- Other constraints such as endangered species concerns will not preclude the beneficial use of this water.

Key Feasibility Factors:

- Need to confirm feasibility of the permeable levee concept along the Brannan/Andrus Island as a means of diverting water from the Sacramento River.
- Need to confirm feasibility of strengthening levee embankments to meet standards of safety.
- Need to confirm the absence of toxic elements in the islands that would become conveyance channels.
- Need to confirm the probable volume of carriage water which can be conserved by implementing this option.

Implementation Effects:

Most Likely Benefits:

- Increased capability to convey water from north of the Delta to users south of the Delta.
- Improved water levels and water quality in the central Delta channels.
- Improved water quality at the export facilities.
- Contribution to restoration of the natural flow direction in the lower portion of the San Joaquin River.

Other Possible Benefits:

- Possible reduction in fish entrainment and predation.
- Possible increase in wetlands habitat.

Most Likely Negative Impacts:

- Reduced flows in the Sacramento River below Rio Vista during high.
- Loss of Delta farmlands and associated wildlife habitat.

Other Possible Negative Impacts:

- Seepage to adjacent islands.

Possible Regulatory and Institutional Constraints:

NEPA, CEQA, Corps Sec. 404 Permit, Corps Sec. 10 Permit, DFG sec. 1600 Permit, Encroachment Permit, Permit from California Safety of Dams, FESA Incidental Take Permit, CESA Section 2081 Permit, Water Right Permit.

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